

REMARKS

Claims 1-23 are pending in the present application. Reconsideration and allowance of pending claims 1-23 in view of the following remarks are requested.

The Examiner has rejected claims 1-4, 7-19, and 22-23 under 35 USC §102(e) as being anticipated by U.S. patent number 6,271,127 to Liu et al. ("Liu"). For the reasons discussed below, Applicant respectfully submits that the present invention, as defined by independent claims 1, 11, 14, and 16, is patentably distinguishable over Liu. However, Applicant reserves the right to provide declarations and/or documents under 37 CFR §1.131 to "swear behind" the effective filing date of Liu.

Subject to Applicant's reserved right to establish priority of the present invention under 37 CFR §1.131, Applicant submits that the present invention, as defined by independent claim 1, teaches "covering a first area in a dielectric, said dielectric having a first dielectric constant," and "exposing a second area in said dielectric to a dielectric conversion source so as to increase said first dielectric constant of said dielectric in said second area to a second dielectric constant." As disclosed in the present application, a first area of a dielectric can be covered, for example, with photoresist, to prevent the first area of the dielectric from being exposed to a dielectric conversion source while a second area of the same dielectric can be exposed to a dielectric conversion source, such as E-beams or I-beams. As a result of the exposure to the dielectric conversion source, the second area of the dielectric, which initially had a first dielectric constant, now has a second dielectric constant, which is greater than the first dielectric constant. Thus, the

dielectric conversion source causes the dielectric constant of the second area of the dielectric to be converted from a first dielectric constant to a higher, second dielectric constant, while the dielectric constant of the unexposed first area of the dielectric remains unchanged.

As disclosed in the present application, by converting the dielectric constant of a second area of a dielectric to a higher dielectric constant, the present invention advantageously achieves an increase in capacitance in the second area of the dielectric, while a covered first area of the dielectric remains at a low capacitance. As a result, the present invention advantageously achieves a low capacitance area of a dielectric, which is more suitable for use in digital circuits, adjacent to a converted high capacitance area of the dielectric, which is more suitable for use in analog circuits requiring a high capacitance density.

In contrast, Liu does not teach, disclose, or suggest “covering a first area in a dielectric, said dielectric having a first dielectric constant,” and “exposing a second area in said dielectric to a dielectric conversion source so as to increase said first dielectric constant of said dielectric in said second area to a second dielectric constant.” Liu specifically discloses depositing low dielectric constant (low-k) material layer 52 over substrate 48 and curing low-k material layer 52 such that hard mask or etch stop 53 is formed in the topmost layer of low-k material layer 52. See, for example, column 6, lines 36-54 and Figures 4b and 4c of Liu. In Liu, low-k material layer 52 is cured by exposure to either an electron beam, which involves electron beam radiation and rapid thermal

heating, or ion implantation, which involves both ion implantation and rapid thermal heating. See, for example, Liu, column 6, lines 46-50. However, Liu fails to teach, disclose, or suggest covering a first area of a dielectric having a first dielectric constant and exposing a second area of the dielectric to a dielectric conversion source such that the dielectric constant of the second area is increased from the first dielectric constant to a second dielectric constant. Moreover, Liu does not even mention increasing a dielectric constant of a first area of a dielectric to a higher dielectric constant. Liu merely discloses forming a hard mask or etch stop in a topmost layer of a low-k material layer.

For all the foregoing reasons, Applicant respectfully submits that the present invention, as defined by independent claim 1, is not suggested, disclosed, or taught by Liu. Thus, independent claim 1 is patentably distinguishable over Liu and, as such, claims 2-4 and 7-10 depending from independent claim 1 are, *a fortiori*, also patentably distinguishable over Liu for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The present invention, as defined by independent claim 11, teaches, among other things, “covering a first area of said dielectric layer” and “exposing a second area in said dielectric layer to a dielectric conversion source so as to increase said first dielectric constant of said dielectric layer in said second area to a second dielectric constant.” For the same reasons as discussed above, the invention, as defined by independent claim 11, is not suggested, disclosed, or taught by Liu. Thus, the present invention, as defined by independent claim 11, is also patentably distinguishable over Liu and, as such, claims 12

and 13 depending from independent claim 11 are, *a fortiori*, also patentably distinguishable over Liu for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The present invention, as defined by independent claim 14, teaches, among other things, “exposing said second area in said dielectric layer to a dielectric conversion source so as to increase said first dielectric constant of said dielectric layer in said second area to a second dielectric constant.” For the same reasons as discussed above, the invention, as defined by independent claim 14, is not suggested, disclosed, or taught by Liu. Thus, the present invention, as defined by independent claim 14, is also patentably distinguishable over Liu and, as such, claim 15 depending from independent claim 14 is, *a fortiori*, also patentably distinguishable over Liu for at least the reasons presented above and also for the additional limitation contained in the dependent claim.

The present invention, as defined by independent claim 16, teaches, among other things, “covering said first area in said gap fill dielectric, said gap fill dielectric having a first dielectric constant” and “exposing said second area in said gap fill dielectric to a dielectric conversion source so as to increase said first dielectric constant of said gap fill dielectric in said second area to a second dielectric constant.” For the same reasons as discussed above, the invention, as defined by independent claim 16, is not suggested, disclosed, or taught by Liu. Thus, the present invention, as defined by independent claim 16, is also patentably distinguishable over Liu and, as such, claims 17-19 and 22-23 depending from independent claim 16 are, *a fortiori*, also patentably distinguishable over

Liu for at least the reasons presented above and also for additional limitations contained in each dependent claim.

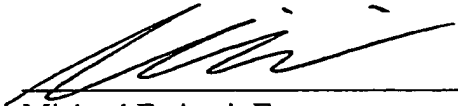
The Examiner has further rejected claims 6 and 21 under 35 USC §103(a) as being unpatentable over Liu in view of U.S. patent number 6,277,732 to Chine-Gie Lou. As discussed above, independent claims 1 and 16 are patentably distinguishable over Liu and, as such, claim 6 depending from independent claim 1 and claim 21 depending from independent claim 16 are, *a fortiori*, also patentably distinguishable over Liu for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The Examiner has further rejected claims 5 and 20 under 35 USC §103(a) as being unpatentable over Liu in view of U.S. patent number 6,042,994 to Yang et al. As discussed above, independent claims 1 and 16 are patentably distinguishable over Liu and, as such, claim 5 depending from independent claim 1 and claim 20 depending from independent claim 16 are, *a fortiori*, also patentably distinguishable over Liu for at least the reasons presented above and also for additional limitations contained in each dependent claim.

Based on the foregoing reasons, the present invention, as defined by independent claims 1, 11, 14, and 16 and claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, claims 1-23 pending in the present application are patentably distinguishable over the art cited by the Examiner. As such, and for all the foregoing reasons, an early Notice of Allowance for all claims 1-23 pending in the present application is respectfully requested.

Respectfully Submitted,
FARJAMI & FARJAMI LLP

Date: 12/1/03

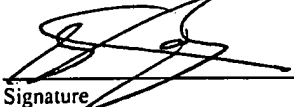

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